Embedded Motherboard

MX855

All-in-One Pentium M/ Celeron M ITX Board With LVDS FP, Audio out,6 USB 2.0, 2 Gigabit Ethernet

User's Manual

http://www.bcmcom.com

Declaration

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WARNING:

Replace your system's CMOS RAM battery only with the identical CR-2032 3V Lithium-Ion coin cell (or equivalent) battery type to avoid risk of personal injury or physical damage to your equipment. Always dispose of used batteries according to the manufacturer's instructions, or as required by the local ordinance (where applicable).

References:

This manual is created and written by BCM Technical Dept., but not limited, to the information from the MX855 External Production Specifications, and MX855 Specifications. If any comments, suggestions, or errors on this manual, please write an e-mail to support@bcmcom.com.

Compliance & Certificate

ISO 9001 Certificate:

This device was produced in our plant with advanced quality system certified by DNV QA Ltd. in according to ISO 9001. This Certificate is valid for:
DESIGN & MANUFACTURE OF MOTHERBOARD AND PERSONAL COMPUTERS.

CE Declaration:

CE marking is a visible declaration by the manufacturer or his authorized representatives that the electrical equipment to which it relates satisfies all the provisions of the 1994 Regulations.

FCC Compliance:

FCC stands for **F**ederal **C**ommunications **C**ommission.
This product complies with FCC Rules Part 15 and has been tested, and complied with the EMI rules by a certified body. In normal operation, there shall be no harmful interference caused by this device nor shall this device accept any interference received, including interference that may cause undesired operation of this product.

Easy Installation

Easy Installation Steps

The following “Easy Installation” steps are for users accustomed to the assembly of a computer system. For those individuals requiring more specific information, please refer to the more detailed descriptions located within the latter chapters of this manual.

Note: You must keep your power cable unplugged until the following installation steps are completed.

Getting Started

-Touch a grounded metal surface to release static electricity stored in your body before unpacking your motherboard. For details please refer to Precaution.

-Install the 3.3 volt un-buffered DDR SDRAM into the 184 pin DIMM slots.

-Plug in any peripheral card(s) that you want to be included in the setup.

-Plug in all cables included in the package except for the power cord.

-Please recheck all steps to ensure no mistakes have been made and then plug in the power cord and turn on the power to enter the BIOS setup, Chapter 3.

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Manual Revision Information

Reversion	Revision History	Date
1.0	First Release	Dec. 2004
1.1	Clarify LVDS Signal Table	Apr. 2005
1.2	Correcting BIOS setup display item and audio information	Jan. 2006
1.3	Update information on LVDS support	Feb. 2006

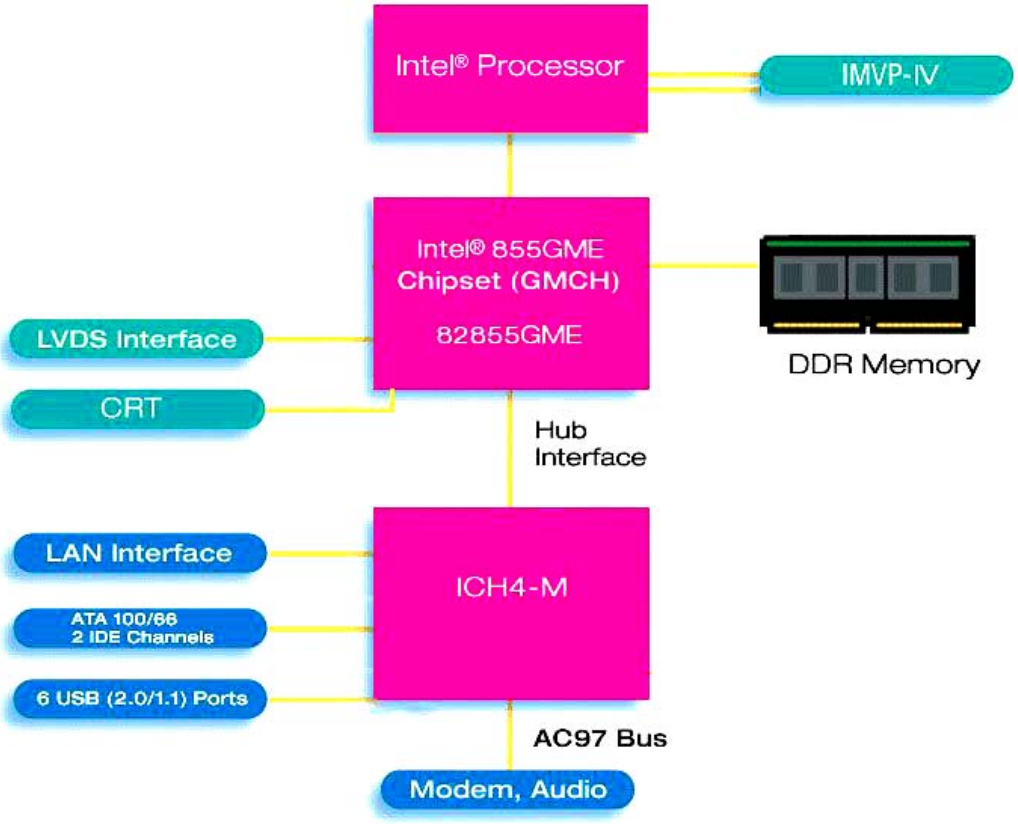
Item Checklist

- ☑ MX855
- ☑ 80 wire ATA66/100 IDE cable
- ☑ 34 wire Floppy cable
- ☑ Audio line out cable
- ☑ 1 COM port cable (DB9)
- ☑ CD for motherboard utilities
- ☑ Standard I/O Shield for MX855
- ☑ MX855 User's Manual on CD (Digital Format)
- ☑ MX855 Quick Reference Guide
- ☑ Custom CPU Heat Sink

Intel Centrino™ Processor Family

The MX855 has been design with Intel® 855GME GMCH and Intel® ICH-4 for Embedded Computing, with build-in optimized integrated graphics solution with a 400 MHz system bus and integrated 32-bit 3D core at 133 MHz. It features a low-power design, supports the Intel® Pentium® M and Intel® Celeron® M processors and up to 1 GB of DDR 333 memory with ECC support.

Intel's platform architecture delivers the performance and high scalability required for today's cutting-edge embedded computing applications. The Intel 855GME GMCH and ICH-4 are part of Intel's comprehensive validation process that enables fast deployment of next-generation platforms to maximize competitive advantage while minimizing development risks.



Chapter 1

Introduction

1-1 Feature of motherboard

The MX855 combines the high performance and exceptional value of Intel® 855GME chipset with a full-featured, new generation, industrial board. The Intel® advanced 855GME chipset support socket 478-pins Intel® Pentium® M / Celeron® M processor of 1.3GHz and up to 2.1GHz, that memory base on the FSB 400/533 MHz operation supports DDR SDRAM interface. In the meantime, the 855GME chipset integrated the LVDS & VGA function. The MX855 system memory size can be up to 1GB DDR memory, onboard two Intel® 82541GI Gigabit Ethernet controllers (support 10/100/1000 Base-TX Ethernet), Audio Line-Out and 2 COM ports, besides the MX855 with four USB2.0 ports on rear panel and two internal USB2.0 ports. They are for POS, Kiosk and high-end embedded applications.

The 82801DB I/O Controller Hub (ICH4) employs the Intel® Accelerated Hub Architecture to make a direct connection from the graphics and memory, IDE controllers supports (ATA/33 or ATA/66 or ATA/100), 6 USB ports that are supported USB 1.1/ 2.0 standard performance, stability and reliability requirements.

The MX855Mini ITX Board is a valuable and it is suitable for all the industry applications, which also well support with the Windows® 98/ 2000/ XP/ NT and Linux operating system.

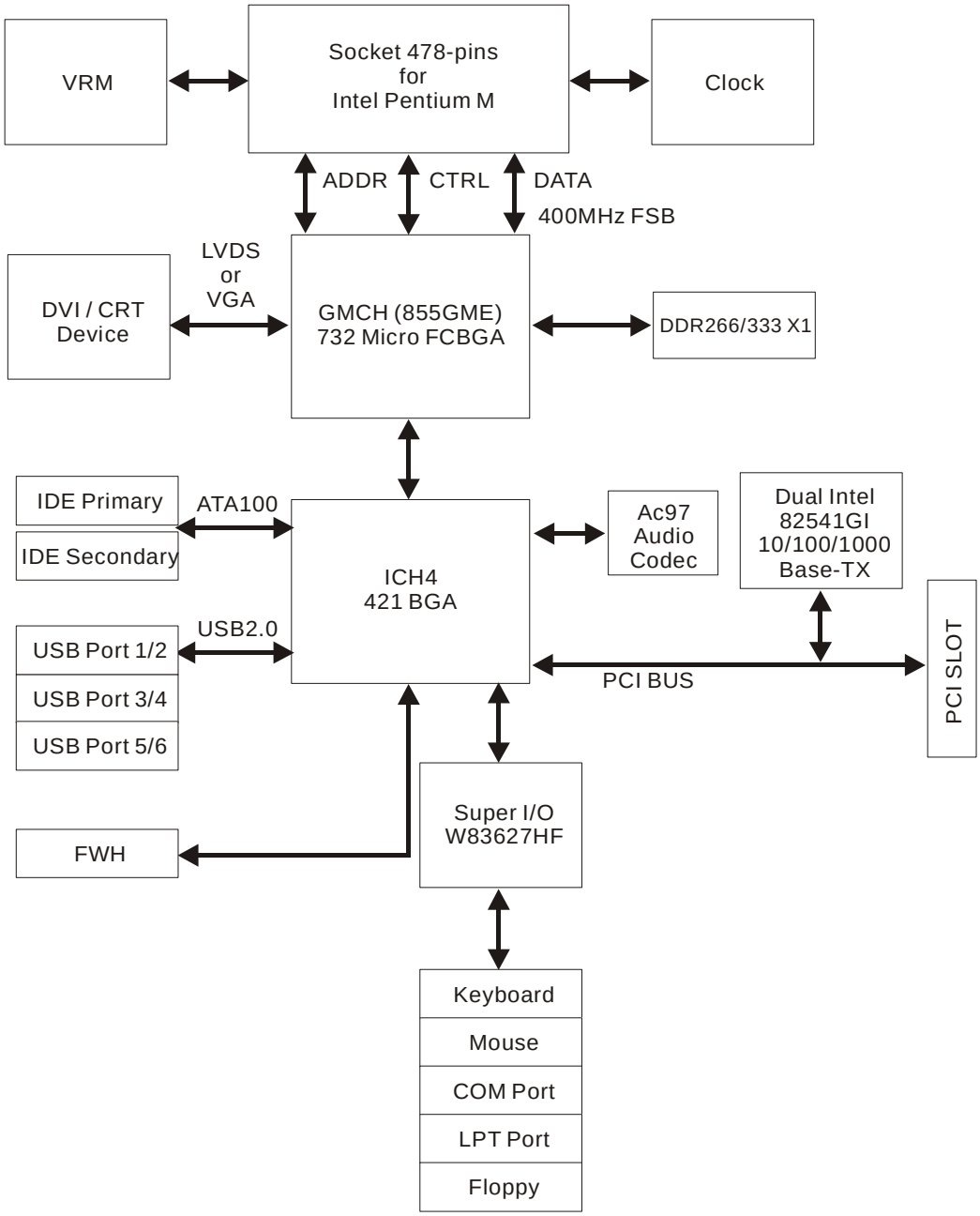
MX855 does provide scalability with high performance & Longevity for Embedded Application. It is really a wise choice of computing solution.

1-2 Specification

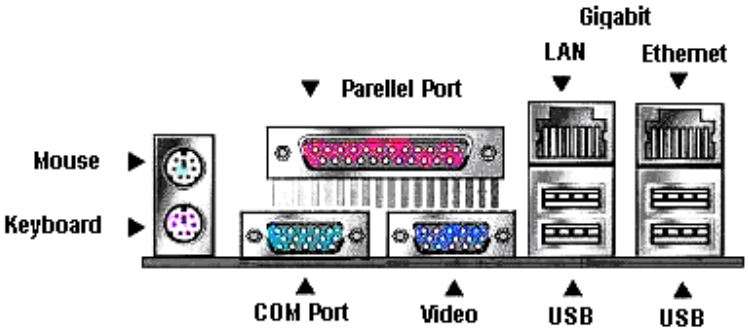
Spec	Description
Design	* Mini ITX form factor 6 layers PCB size: 6.69”(W) x 6.69”(D) (170 x 170 mm)
Chipset	* Intel 82855GME GMCH Chipset * Intel 82801DB ICH4 Chipset
CPU Socket	* Support socket 478 Intel Pentium M (Banias and Dothan) core processor with 1MB or 2MB L2 cache. * System bus Frequency 400/533MHz FSB
Video Display	* Intel 855GME chipset integrated LVDS & graphic controller * Intel Extreme II High Performance 2D/3D, resolution up to 1600 x1200 UXGA * Support Dual 18-bit LVDS Interface
Memory Socket	* 184-pin DDR SDRAM module socket 1x * Support Memory Type up to 512Mbit x8/x16 Technology * Support 1M, 2M, 4M, 8M, 32M, 64M x N DRAMs * Support DDR200/266/333 SDRAM * Expandable to 1GB
Expansion Slot	* 1x 32-bit PCI slot * PCI Rev 2.2 compliant
Integrate IDE	* Two PCI IDE controllers support PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100 functions that deliver the data transfer rate up to 100 MB/s
LAN On Board	* 2x Intel 82541 10/100/1000 PCI Ethernet LAN
Audio	* AC’97 Digital Audio controller integrated * AC’97 2.2 Audio CODEC on board * Sound Blaster Pro compliant * Audio driver and utility included
BIOS	* Phoenix/ Award 4MB Flash ROM
I/O	* PS/2 keyboard and PS/2 mouse connectors * Floppy disk drive connector x1 * Parallel port x1, Serial port x2 (one on header) * USB 2.0 connector x6, (2 on header) * Audio connector Line-out * Fast IRDA pin header
BIOS	* Award (Phoenix PNP BIOS * APM /ACPI compliant
Power	* ATX standard 20-pin power connector

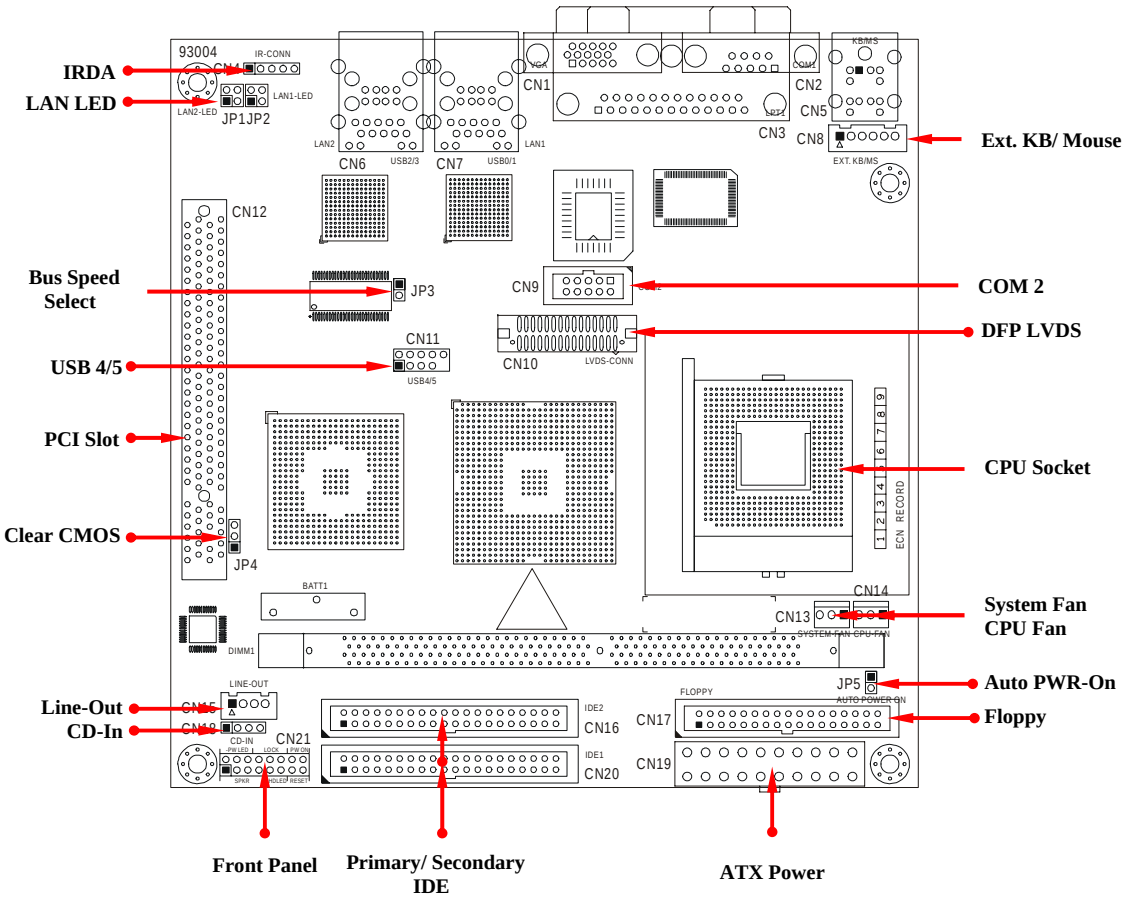
1-3 System Diagram

MX855 Mainboard Diagram



Jumper & Connector





Jumpers

Jumper	Name	Description	Page
JP1	LAN 2 LED	4-pin Block	
JP2	LAN 1 LED	4-pin Block	
JP3	CPU Type Setting Select	2-pin Block	
JP4	Clear CMOS	6-pin Block	
JP5	Power On Setting Select	2-pin Block	
JP6	LCD Power Setting Select	3-pin Block	

Connector / Header

Socket/Slot	Name	Description	Page
CN1	CRT VGA Port Front Panel	DB-15C Female Connector	
CN2	COM1 RS232 Serial Port	DB9 Connector	
CN3	Parallel Port Secondary IDE	DB25 Connector	
CN4	IRDA	5-pin Block (2.54mm pitch)	
CN5	PS/2 Keyboard & Mouse	6-pin Mini DIN Connector	
CN6	USB 2/3 & Gigabit Ethernet Port	USB & RJ45 Connector	
CN7	USB 0/1 & Gigabit Ethernet Port	USB & RJ45 Connector	
CN8	External Keyboard & Mouse Connector	5-pin Connector	
CN9	COM2 RS232 Port Header	10-pin Block (2.54mm pitch)	
CN10	DFP LVDS Panel Connector	40-pin Block (HIROSE DF13-40DP)	
CN11	USB 4/5 Header	10-pin Block (2.54mm pitch)	
CN13	System Fan Header	3-pin Connector	
CN14	CPU Fan Header	3-pin Connector	
CN15	Audio Line-Out	4-pin Connector	
CN16	Secondary IDE	40-pin Connector	
CN17	Floppy	34-pin Connector	
CN18	CD_IN	4-pin Block	
CN19	ATX Power	20-pin Block	
CN20	Primary IDE	40-pin Connector	
CN21	Front Panel	16-pin Block (2.54mm pitch)	

Chapter 2
Hardware installation

2-1 Hardware installation Steps

Before using your computer, you had better complete the following steps:

1. Check motherboard jumper setting
2. Install CPU and Fan
3. Install System Memory (DIMM)
4. Install Expansion cards
5. Connect IDE and Floppy cables, Front Panel /Back Panel cable
6. Connect ATX Power cable
7. Power-On and Load Standard Default
8. Reboot
9. Install Operating System
10. Install Driver and Utility

2-2 Checking Motherboard's Jumper Setting

(1) CMOS RAM clear (3-pin): JP4

A battery must be used to retain the motherboard configuration in CMOS RAM, short 2-3 pins of JP4 to store the CMOS data.

To clear the CMOS, follow the procedure below:

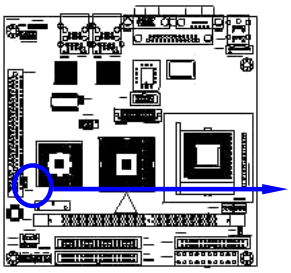
1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JP1 and short pins 2-3 for a few seconds
4. Return JP1 on its normal setting by shorting pins 1-2
5. Connect ATX power cable back to ATX power connector

Note: When should clear CMOS

1. Troubleshooting

2. Forget password

3. After over clocking system boot fail



CMOS RAM Clear Setting

2-3 Install CPU

2-3-1 Glossary

Chipset (or core logic) – A highly integrated circuits which control the interfaces between the system processor, RAM, I/O devises, and adapter cards.

Processor slot/socket - the slot or socket used to mount the system processor on the motherboard.

Slot (AGP, PCI, ISA, RAM) - the slots used to mount adapter cards and system RAM.

PCI - Peripheral Component Interconnect - a high speed interface for video cards, sound cards, network interface cards, and modems; runs at 33MHz.

ISA - Industry Standard Architecture - a relatively low speed interface primarily used for sound cards and modems; runs at approx. 8MHz.

Serial Port - a serial data transfer interface typically used for mouse and external modems.

Parallel Port - a parallel data transfer interface typically used for printers.

PS/2 - a low speed interface used for mouse and keyboards.

USB - Universal Serial Bus - a PnP connect interface used for mouse, keyboards, scanners, printers, hard drive, DVD/ CDROM and digital cameras.

Sound (interface) - the interface between the sound card or integrated sound connectors and speakers.

LAN (interface) - Local Area Network - the interface to your local area network.

BIOS (Basic Input/Output System) - the program logic used to boot up a computer and establish the relationship between the various components.

Driver - software, which defines the characteristics of a device for use by another device or other software.

Processor - the "Central Processing Unit" (CPU); the principal integrated circuit used for doing the "computing" in "personal computer"

Front Side Bus Frequency - the working frequency of the motherboard, which is generated by the clock generator for CPU, DRAM and PCI BUS.

CPU L2 Cache - the flash memory inside the CPU, normally Intel P4 CPU has 512K or above, while Celeron will have 256K.

2-3-2 About Intel Pentium M/ Celeron M

This motherboard provides with a ZIF 478 socket Pentium M/ Celeron M system processor. The Pentium M architecture and 855GMEon chips provide a x86-base solution, a highly compatible, high performance, low heat dissipation and low power solution make mobile embedded system application possible.

The CPU should have a cooling FAN attached to prevent overheating. If this is not the case, then make sure the CPU has a sufficient cooling to dissipate heat generate from the CPU.

WARNING! Be sure that there is sufficient air circulation across the processor's heatsink and CPU cooling FAN is working correctly, otherwise it may cause the processor and motherboard overheat and damage, you may install an auxiliary cooling FAN, if necessary.

2-4 Install Memory

This motherboard provides one 184-pin DIMM (**D**UAL **I**NLINE **M**EMORY **M**ODULES) sites for memory expansion available to maximum memory size of 1.0GB DDR SDRAM.

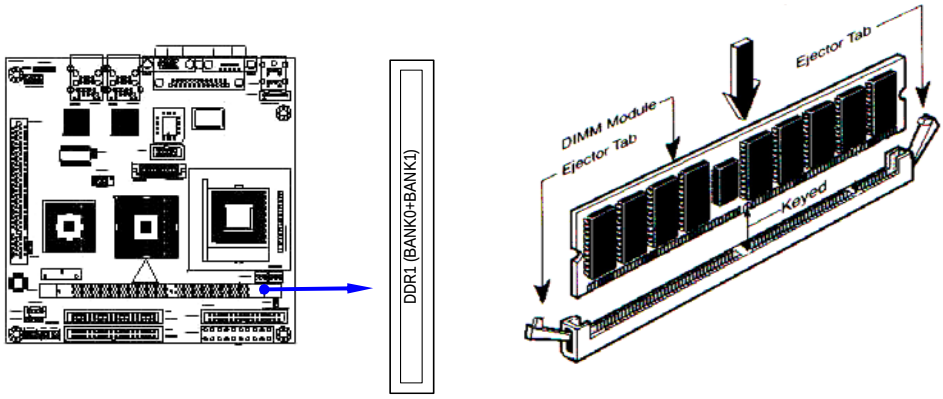
- Support 128Mb, 256Mb, 512Mb technologies implemented as x8, x16 devices.
- ECC, Non-ECC DIMMS.

Valid Memory Configurations

Bank	184-Pin DIMM		Total Memory
Bank 0, 1 (DDR0)	200 /266/333 DDR SDRAM Module	X1	64MB~1.0GB
Total	System Memory (Max. 1.0GB)	1	64MB~1.0GB

NOTE! Make sure the installed memory are DDR266 SDRAM support 133MHz memory clock, otherwise the system may hang during startup. PC2100/ PC2700 DDR are recommended.

Generally, installing DDR SDRAM modules to your motherboard is very easy, refer to figure 2-4 to see what a 184-Pin DDR200/DDR266 SDRAM module looks like.



NOTE! When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indention on both sides.

WARNING! For the DDR SDRAM CLOCK is set at 133MHz, use only DDR266-compliant DDR Modules. When this motherboard operate at 133Mhz, most system will not even boot if non-compliant modules are used because of the strict timing issues, if your SDR Modules are not DDR266-compliant, set the DDR SDRAM clock to 100MHz to ensure system stability.

2-5 Expansion Cards

WARNING! Turn off your power when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

2-5-1 Procedure For Expansion Card Installation

1. Read the documentation for your expansion card and make any necessary hardware or software setting for your expansion card such as jumpers.
2. Remove your computer's cover and the bracket plate on the slot you intend to use.
3. Align the card's connectors and press firmly.
4. Secure the card on the slot with the screen you remove above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary.
7. Install the necessary software driver for your expansion card.

2-5-2 Assigning IRQs For Expansion Card

Some expansion cards need an IRQ to operate. Generally, an IRQ must exclusively assign to one use. In a standard design, there are 16 IRQs available but most of them are already in use.

Standard Interrupt Assignments

IRQ	Priority	Standard function
0	N/A	System Timer
1	N/A	Keyboard Controller
2	N/A	Programmable Interrupt
3 *	8	Communications Port (COM2)
4 *	9	Communications Port (COM1)
5 *	6	Onboard Display Controller
6 *	11	Floppy Disk Controller
7 *	7	Printer Port (LPT1)
8	N/A	System CMOS/Real Time Clock
9 *	10	ACPI Mode when enabled
10 *	3	IRQ Holder for PCI Steering
11 *	2	IRQ Holder for PCI Steering
12 *	4	PS/2 Compatible Mouse Port
13	N/A	Numeric Data Processor
14 *	5	Primary IDE Channel
15 *	1	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2-5-3 Interrupt Request Table For This Motherboard

Interrupt request are shared as shown the table below:

	INT A	INT B	INT C	INT D	INT E	INT F	INT G	INT H
Slot 1	**INTD#**	**INTA#**	**INTB#**	**INTC#**				
Onboard LAN 1					√			
Onboard LAN 2						√		

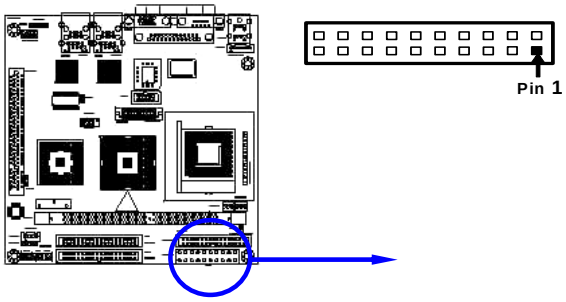
IMPORTANT! If using PCI cards on shared slots, make sure that the drivers support "Shared IRQ" or that the cards don't need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

2-6 Connectors, Headers

2-6-1 Connectors

(1) Power Connector (20-pin block): ATXPWR (CN19)

ATX Power Supply connector is a 20-pins connector comply with Intel ATX standard. The ATX Power Supply allows to use soft power on with a momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel power switch is momentarily pressed. Press this power switch again will turn off the power to the system board.



PIN	ROW2	ROW1
1	3.3V	3.3V
2	-12V	3.3V
3	GND	GND
4	Soft Pwr On	5V
5	GND	GND
6	GND	5V
7	GND	GND
8	-5V	Power OK
9	+5V	+5V (for Soft Logic)
10	+5V	+12V

(2) PS/2 Mouse & PS/2 Keyboard Connector: PS2 KB/MOUSE (Mini DIN 6)

Connectors for PS/2 keyboard and PS/2 Mouse.

(3) USB Port connector: USB (USB1/ 2/ 3/ 4)

Connectors are 4-pin connector that connect USB devices to the system board.

(4) LAN Port connector: LAN (RJ45)

Connector is standard RJ45 connector for Network connector.

(5) Parallel Port Connector: LPT (25-pin female)

Parallel Port connector is a 25-pin D-Subminiature Receptacle connector. The On-board Parallel Port can be disabled through the BIOS SETUP. Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information.

(6) Audio Connector : (3.5mm Mini Jack)

This heater allow you to connect a LINE-OUT

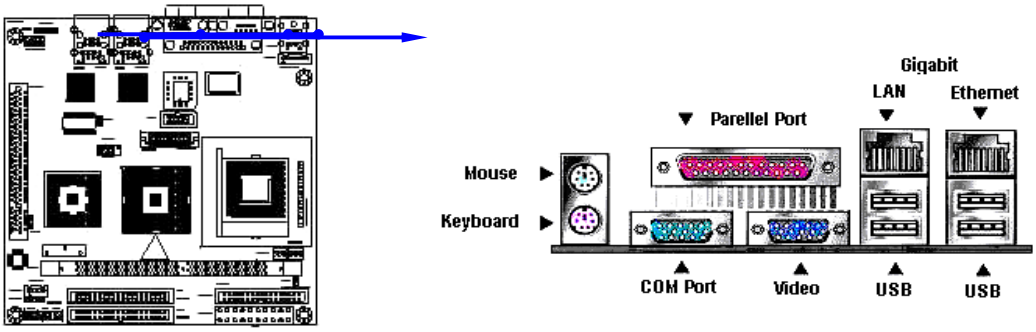
Line-out : Audio output to speaker

(7) VGA Connector: VGA (15-pin D-Sub)

VGA is the 15-pin D-Subminiature female connector for display monitor.

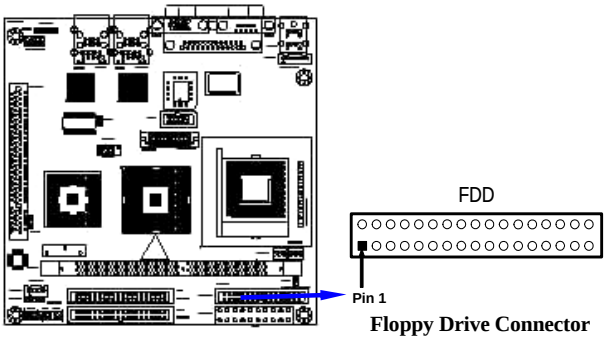
(8) Serial Port COM1: (DB9 Male)

COM1 is the 9-pin D-Subminiature male connector. The On-board serial port can be disabled through BIOS SETUP. Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information.



(9) Floppy drive Connector (34-pin block): FDD (CN17)

This connector supports the provided floppy drive ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to the floppy drives.

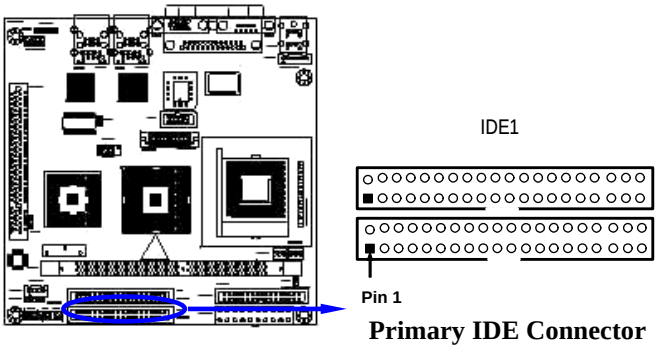


Floppy Drive Connector

Signal	Pin		Signal
GND	1	2	DRVDEN0#
GND	3	4	NC
GND	5	6	DRVDEN1#
GND	7	8	INDEX#
GND	9	10	MOA#
GND	11	12	DSB#
GND	13	14	DSA#
GND	15	16	MOB#
GND	17	18	DIR#
GND	19	20	STEP#
GND	21	22	WD#
GND	23	24	WE#
GND	25	26	TRAK0#
GND	27	28	WPT#
GND	29	30	RDATA#
GND	31	32	SIDE1#
GND	33	34	DSKCHG#

10) Primary IDE Connector (40-pin block): IDE1 (CN20)

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.

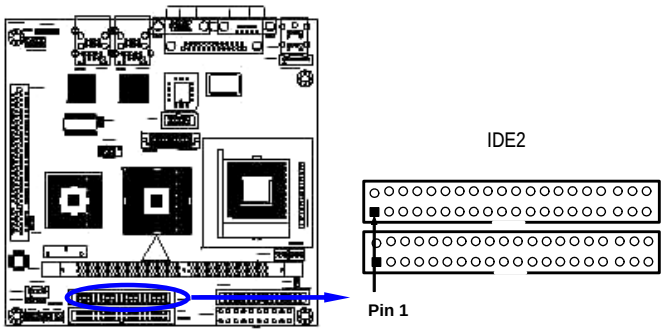


Primary IDE Connector

Signal	PIN	Signal	
GND	1	2	DACT#
DCS3#	3	4	DCS1#
DA2	5	6	DA0
NC	7	8	DA1
NC	9	10	IRQ14
GND	11	12	DACK#
GND	13	14	IORDY
GND	15	16	IOR#
GND	17	18	IOW#
GND	19	20	DREQ
NC	21	22	GND
D15	13	24	D0
D14	15	26	D1
D13	17	28	D2
D12	19	30	D3
D11	31	32	D4
D10	33	34	D5
D9	35	36	D6
D8	37	38	D7
GND	39	40	RESET#

(11) Secondary IDE Connector (40-pin block): IDE2 (CN16)

This connector connects to the next set of Master and Slave hard disks. Follow the same procedure described for the primary IDE connector. You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.



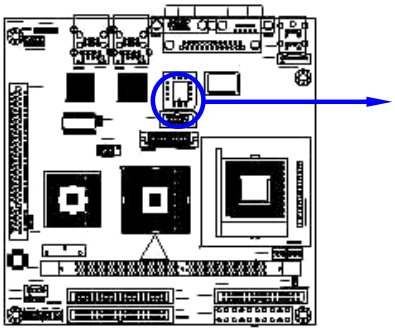
Secondary IDE Connector

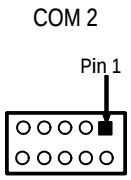
Signal	PIN	Signal	
GND	1	2	DACT#
DCS3#	3	4	DCS1#
DA2	5	6	DA0
NC	7	8	DA1
NC	9	10	IRQ14
GND	11	12	DACK#
GND	13	14	IORDY
GND	15	16	IOR#
GND	17	18	IOW#
GND	19	20	DREQ
NC	21	22	GND
D15	13	24	D0
D14	15	26	D1
D13	17	28	D2
D12	19	30	D3
D11	31	32	D4
D10	33	34	D5
D9	35	36	D6
D8	37	38	D7
GND	39	40	RESET#

- Two hard disks can be connected to each connector. The first HDD is referred to as the “Master” and the second HDD is referred to as the “Slave”.
- For performance issues, we strongly suggest you don’t install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk. Otherwise, the system performance on this channel may drop.

2-6-2 Headers

(1) Serial Port COM 2 (9-pin) Header: (CN9)



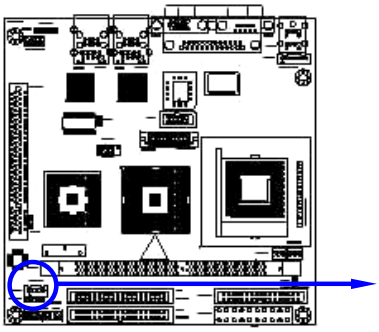


Signal	Pin		Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	5V

Serial Port 2 Header

2) Audio Header (4-pin): AUDIO Line-Out: (CN15)

This header connects to Front Panel Line-out connector with cable.

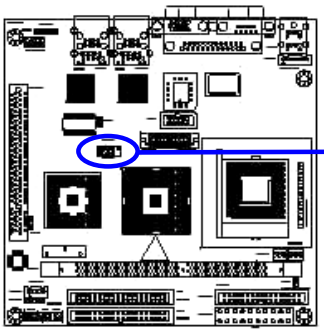


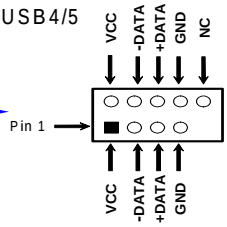
Pin	Signal
1	Line Out L
2	AU_GND
3	AU_GND
4	Line Out R

Audio Line-Out

(3) USB Port Headers (9-pin): USB 4/5 (CN11)

These headers are used for connecting the additional USB port plug. By attaching an option USB cable, your can be provided with two additional USB plugs affixed to the back panel.

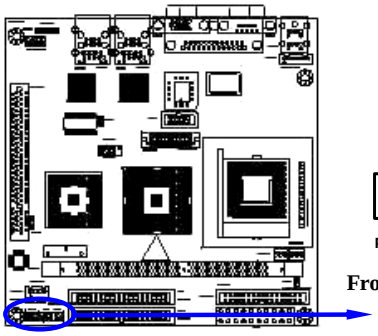


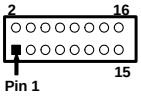


USB Port Headers

Signal	Pin		Signal
VCC	1	2	VCC
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
NC	9	10	Key

(4) Front Panel Headers (16-pin): (CN21)





Front Panel Connector

Signal	Pin#	Pin#	Signal
5V	1	2	5V
NC	3	4	NC
Buzz (NC)	5	6	GND
SPKR	7	8	KBLOCK
5V	9	10	GND
HDDLED-	11	12	NC
RESET+	13	14	5V
GND	15	16	PWRBT-

(5) PC-Speaker connector: (CN21 1,7)

This 2-pin connector connects to the case-mounted speaker.

(6) IDE Activity LED: IDE LED CN21 (9,11)

This connector connects to the hard disk activity indicator light on the case.

(7) Reset switch lead: RESET CN21 (13-15)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the lift of the system's power supply. See the figure below.

(8) Power LED CN21 (2,6)

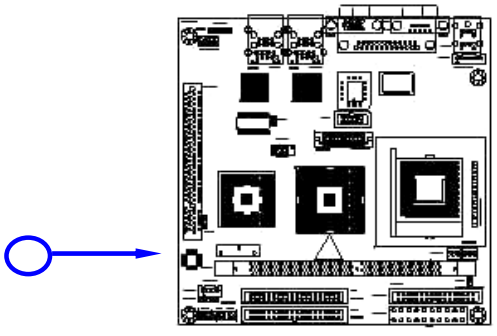
The Power LED is light on while the system power is on. Connect the Power LED from the system case to this pin.

(9) Power switch: PWR BTN CN21 (14-16)

This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.

(10) FAN Speed Headers (3-pin): CPU Fan , System Fan

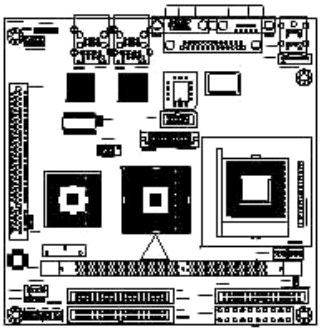
These connectors support cooling fans, depending on the fan manufacturer, the wire and plug may be different. The red wire should be positive, while the black should be ground.

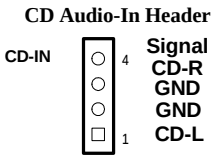


FAN Speed Headers

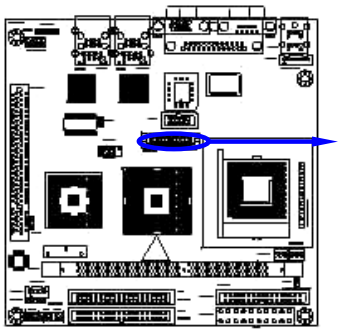
(11) CD Audio-In Headers (4-pin): CD-IN (CN18)

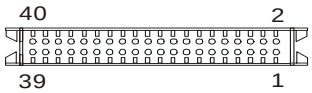
CDIN are the connectors for CD-Audio Input signal. Please connect it to CD-ROM CD-Audio output connector.





(12) LCD Panel and Inverter Header (40-pin): LVDS (CN10)





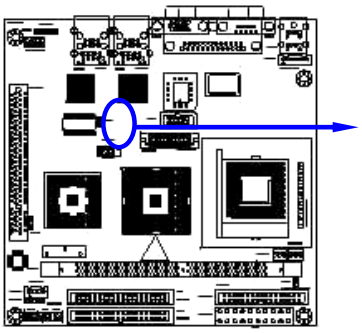
Signal name	Description
CLKB+, CLKA+	Positive LVDS differential clock2 & clock1
CLKB-, CLKA-	Negative LVDS differential closk2 & clock1
YA[ ]+, YB[ ]+[0:3]	Positive LVDS differential data
YA[ ]- , YB[ ]- [0:3]	Negative LVDS differential data
VCC_LCD	LCD backlight voltage +3.3V, +5V (See JP6)
GND	Ground
+12	+12V
LCD_BLK	Enable backlight signal.

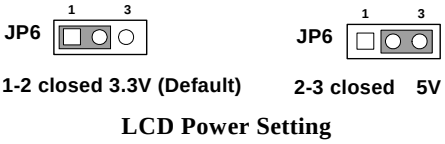
LCD Panel Connector

HIROSE DF-13-40DP-1.25V

Signal	Pin		Signal
NC	1	2	NC
GND	3	4	GND
YA0-	5	6	YA1-
YA0+	7	8	YA1+
GND	9	10	GND
YA2-	11	12	CLKA-
YA2+	13	14	CLKA+
GND	15	16	GND
YA3-	17	18	YB0-
YA3+	19	20	YB0+
GND	21	22	GND
YB1-	23	24	YB2-
YB1+	25	26	YB2+
GND	27	28	GND
CLKB-	29	30	YB3-
CLKB+	31	32	YB3+
NC	33	34	+12V
NC	35	36	+12V
NC	37	38	VCC_LCD
LCD_BKL	39	40	VCC_LCD

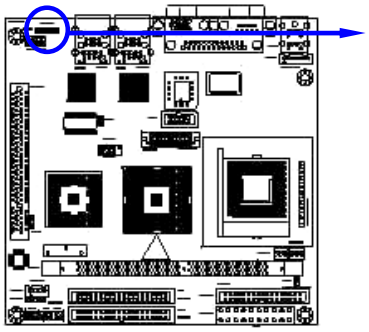
(12) LCD Panel Power Setting (JP6)



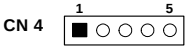


LCD Power Setting

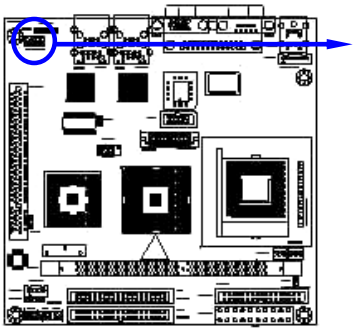
(14) IrDA Connector (CN4)



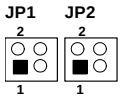
Signal	Pin#
+5V	1
FIRTX	2
IRRX	3
GND	4
IRTX	5



(15) LAN LED Header (JP1, JP2)



Signal	Pin#	Pin#	Signal
Link_LED	1	2	VCC_3V
ACT_LED	3	4	VCC_3V



2-7 Starting Up Your Computer

1. After all connection is made, close your computer case cover.
2. Be sure all the switch are off, and check that the power supply input voltage is set to the local voltage, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.
3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.
4. Turn on your peripheral as following order:
   a. Your monitor.
   b. Other external peripheral (Printer, Scanner, External Modem etc…)
   c. Your system power. For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.
5. The power LED on the front panel of the system case will light. The LED on the monitor may light up or switch between orange and green after the system is on. If it complies with green standards or if it is has a power standby feature. The system will then run power-on test. While the test is running, the BIOS will alarm beeps or additional message will appear on the screen.

   If you do not see any thing within 30 seconds from the time you turn on the power. The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Beep	**Meaning**
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM install or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

6. During power-on, press <Del> key to enter BIOS setup. Follow the instructions in BIOS SETUP.
7. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch. For ATX power supply, you can press ATX power switching after exiting or shutting down your operating system. If you use Windows 9X, click **"Start"** button, click **"Shut down"** and then click **"Shut down the computer?"** The power supply should turn off after windows shut down.

Chapter 3

Introducing BIOS

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and the operating system. When you start the computer, the BIOS program gain control. The BIOS first operates a self-diagnostic test called POST (Power On Self Test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

In the BIOS Setup main menu of Figure 3-1, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press <Esc> to quit the BIOS Setup.
- Press ↑↓←→ (up, down, left, right) to choose, in the main menu, the option you want to confirm or to modify.
- Press <F10> when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.
- Press Page Up/Page Down or +/– keys when you want to modify the BIOS parameters for the active option.

3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup.

If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press <F1> to continue, <Ctrl-Alt-Esc> or <Del> to enter Setup

3-2 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

3-3 The Main Menu

Once you enter Award® BIOS CMOS Setup Utility, the Main Menu (Figure 3-1) will appear on the screen. The Main Menu allows you to select from fourteen setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

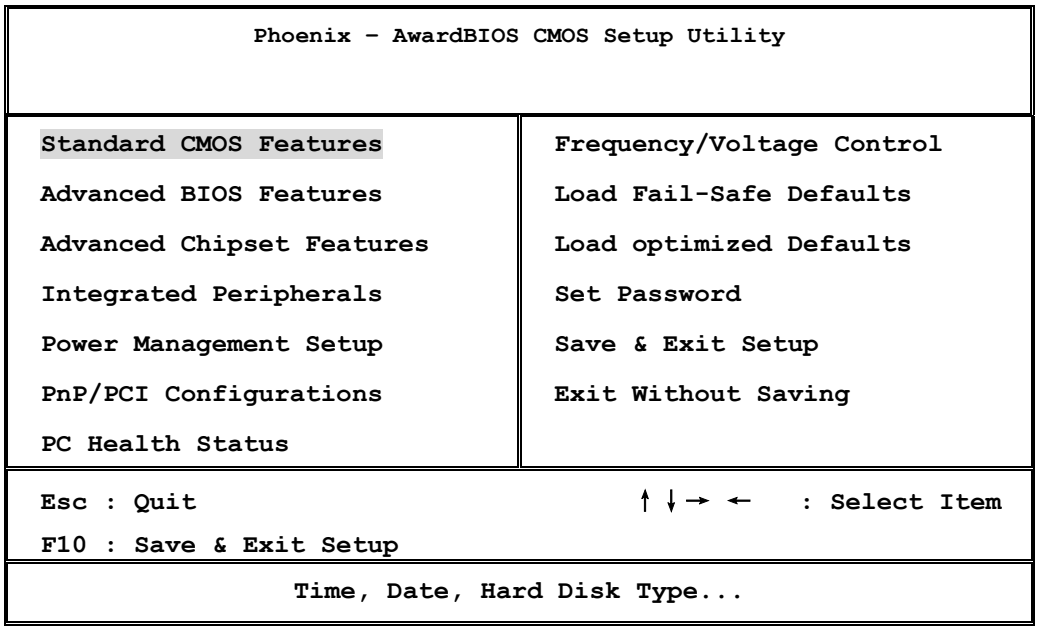


Figure 3-1

Standard CMOS Features

Use this Menu for basic system configurations.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PnP/PCI configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This entry shows your PC health status.

Frequency/Voltage Control

Use this menu to specify your settings for frequency clock control.

Load Optimized Defaults

Use this menu to load the BIOS default values that are settings for optimal performances system operations.

Load Standard Defaults

Use this menu to load the BIOS default values that are factory settings for the stable performance system operation.

Set User Password

Use this menu to set User Passwords.

Save & Exit Setup

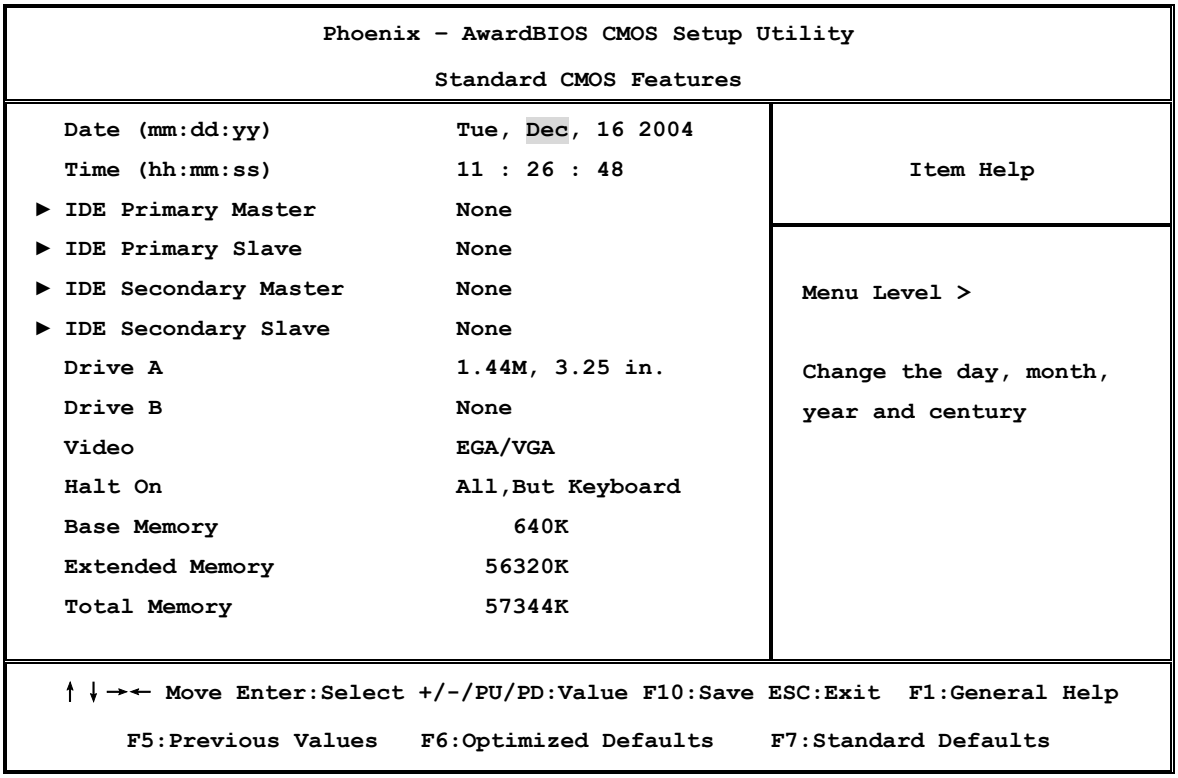
Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

3-4 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into several categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date

The date format is <day><month><date><year>.

Day Day of the week, from Sun to Sat, determined by BIOS. Read-only.

Month The month from Jan. through Dec.

Date The date from 1 to 31 can be keyed by numeric function keys.

Year The year depends on the year of the BIOS.

Time The time format is <hour><minute><second>.

Primary Master/Primary Slave

Secondary Master/Secondary Slave

Press PgUp/<+> or PgDn/<–> to select Manual, None, Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually.

If you select Manual, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be “None”.

If the controller of HDD interface is CD-ROM, the selection shall be “None”

Access Mode	The settings are Auto Normal, Large, and LBA.
Cylinder	number of cylinders
Head	number of heads
Precomp	write precomp
Landing Zone	landing zone
Sector	number of sectors

3-5 Advanced BIOS Features

```
                    Phoenix – AwardBIOS CMOS Setup Utility
                              Advanced BIOS Features

► CPU Feature                  [Press Enter]          |  Item Help
  Virus Warning                [Disabled]             |
  CPU L1 & L2 Cache            [Enabled]              |
  CPU L3 Cache                 [Enabled]              |  Menu Level >
  Quick Power On Self Test     [Enabled]              |
  First Boot Device            [Floppy]               |
  Second Boot Device           [HDD-0]                |
  Third Boot Device            [CDROM]                |
  Boot other Device            [Enabled]              |
  Swap Floppy Drive            [Disabled]             |
  Boot Up Floppy Seek          [Enabled]              |
  Boot Up NumLock Status       [On]                   |
  Gate A20 Option              [Fast]                 |
  Typematic Rate Setting       [Disabled]             |
x Typematic Rate (Chars/Sec)    6                     |
x Typematic Delay (Msec)        250                   |
  Security Option              [Setup]                |
  APIC Mode                    [Enabled]              |
  MPS Version Control For OS   [1.4]                  |
  OS Select For DRAM > 64MB    [Non-OS2]              |
  Console Redirection          [Disable]              |
x Baud Rate                    19200                  |
  Agent Connect via            [Null]                 |
  Agent wait time<min>         [1]                    |
  Agent after boot             [Enable]               |
  Report No FDD for Win 95     [No]                   |

↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help
     F5:Previous Values   F6:Optimized Defaults    F7:Standard Defaults
```

Hard Disk Boot Priority

Allow you to select Hard Disk boot Priority.

Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Disabled (default) No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Enabled Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table.

CPU Internal Cache

The default value is Enabled.

Enabled (default) Enable cache

Disabled Disable cache

Note: The internal cache is built in the processor.

External Cache

Choose Enabled or Disabled. This option enables the Level 2 cache memory.

CPU L2 Cache ECC Checking

Choose Enabled or Disabled. This option enables the Level 2 cache memory ECC (error check correction).

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If this is set to Enabled. BIOS will shorten or skip some check items during POST.

Enabled (default) Enable quick POST

Disabled Normal POST

First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The settings are Floppy, LS/ZIP, HDD-0/HDD-1/HDD-3, SCSI, CDROM, LAD and Disabled.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Boot Up NumLock Status

The default value is On.

On (default) Keypad is numeric keys.

Off Keypad is arrow keys.

Gate A20 Option

Normal The A20 signal is controlled by keyboard controller or chipset hardware.

Fast (default) The A20 signal is controlled by port 92 or chipset specific method.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected. The settings are: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets a number of times to repeat a keystroke in a second when you hold the key down. The settings are: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before is begins to repeat the keystroke. The settings are 250, 500, 750, and 1000.

Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup (default)	The system will boot, but access to Setup will be denied if the correct password is not entered prompt.

OS Select For DRAM > 64MB

Allows OS2® to be used with >64MB or DRAM. Settings are Non-OS/2 (default) and OS2. Set to OS/2 if using more than 64MB and running OS/2.

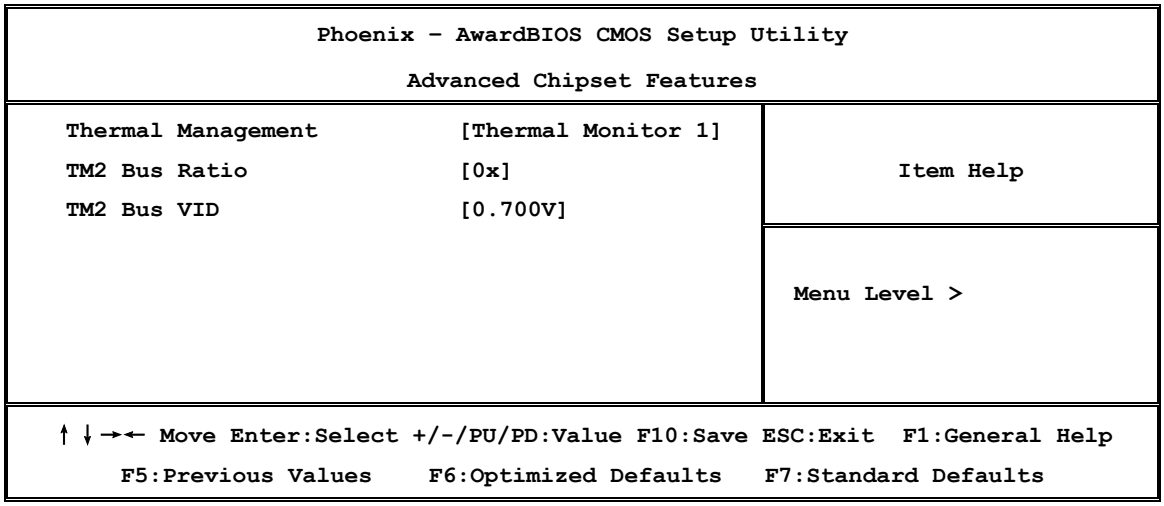
Video BIOS Shadow

Allows you to Enable or Disable video BIOS caching to system memory.

Small logo(EPA) Show

Allows you to Enable or Disable the EPA logo when system start.

3-5-1 CPU Feature



Thermal Management

The selection available are:

Thermal Monitor 1 < On die throtting>

Thermal Monitor 2 < Ratio & VID transistion>

TM2 Ratio

Represents the frequency <bus ratio of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.

Available is 0 –255 [Default 0]

TM2 Bus VID

Represents the voltage of the throttled performance state that will be initialed when on-die sensor goes from not hot to hot.

Available is 0.700 –1.708 [Default 0.700V]

3-6 Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

```
                Phoenix – AwardBIOS CMOS Setup Utility
                        Advanced Chipset Features

DRAM Timing Selectable      [By SPD]          |  Item Help
CAS Latency Time            [2.5]             |
Active to Precharge Delay   [7]               |
DRAM RAS# to CAS# Delay     [3]               |
DRAM RAS# Precharge         [3]               |  Menu Level >
DRAM Data Integrity Mode    [Non- ECC]        |
MGM Core Frequency          [Auto Max 266MHz] |
System BIOS Cacheable       [Enabled]         |
Video BIOS Cacheable        [Disabled]        |
Memory Hole At 15M-16M      [Disable]         |
Delay Prior to Thermal      [16 Min]          |
AGP Aperture Size <MB>      [64]              |

** On-Chip VGA Setting **
On-Chip VGA                 [Enable]          |
On-Chip Frame Buffer Size   [32MB]            |
Boot Display                [CRT]             |
Panel Scaling               [Auto]            |
Panel Number                [1]               |
BIOS Update                 [Enable]          |

↑ ↓ →← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help
    F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults
```

DRAM Clock/Drive Control
Please refer to section 3-6-1

AGP & P2P Bridge Control
Please refer to section 3-6-2

CPU & PCI Bus Control
Please refer to section 3-6-2

Memory Hole
You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this

area of system memory usually discusses their memory requirements. The settings are: Enabled and Disabled.

System BIOS Cacheable
Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The settings are: Enabled and Disabled.

Video RAM Cacheable
Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The settings are: Enabled and Disabled.

VGA Share Memory Size

In this item you can assign video memories size share from the system memories, available options are 16, 32, 64.

Select Display Device

Allow you to select type of display CRT, LCD, DVI, TV.

TV_Type

Allow you to select TV standard NTSC, PAL…

TV_Connector

Allow you to select type of TV connector SVideo, RGB, CVBS, SDTV…

TV_Layout

Allow you to select type of display Component, RGB, SVideo...

Panel Type

Allow you to select different type of LCD panel resolution 640x480, 800x600, 1024x768...

DRAM Clock

When “By SPD” has been select, BIOS will read SDRAM module SPD information pre-define by memory module manufacture or select a 133MHz memory clock.

DRAM Timing

When “By SPD” has been select, BIOS will read SDRAM module SPD information pre-define by memory module manufacture.

SDRAM CAS Latency

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. The settings are: 2T and 2.5T.

Note: Change these settings only if you are familiar with the chipset.

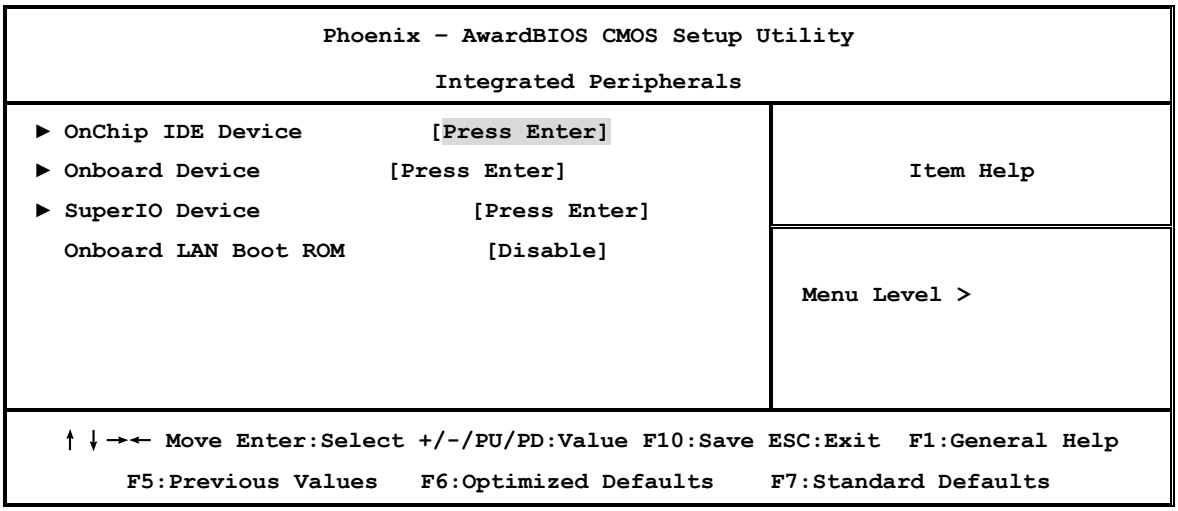
SDRAM RAS# to CAS# Delay

This field let's you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The settings are: 2T, 3T and 4T.

SDRAM RAS# Precharge Time

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain date. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system. The settings are: 2T, 3T and 4T.

3-7 Integrated Peripherals



OnChip IDE Device

Please refer to section 3-7-1

Onboard Device

Please refer to section 3-7-2

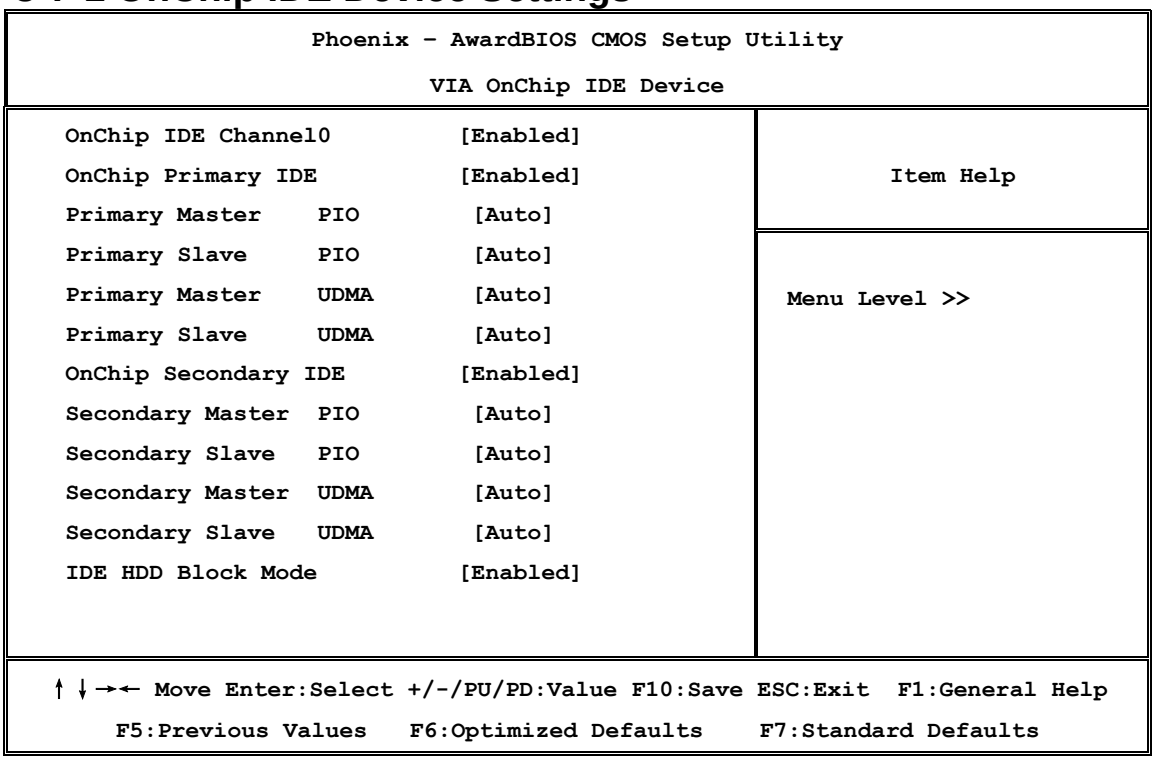
Super IO Device

Please refer to section 3-7-3

Onboard LAN Boot ROM

This item allows you to invoke the boot ROM of onboard LAN chip. The settings are: Enable, Disable.

3-7-1 OnChip IDE Device Settings



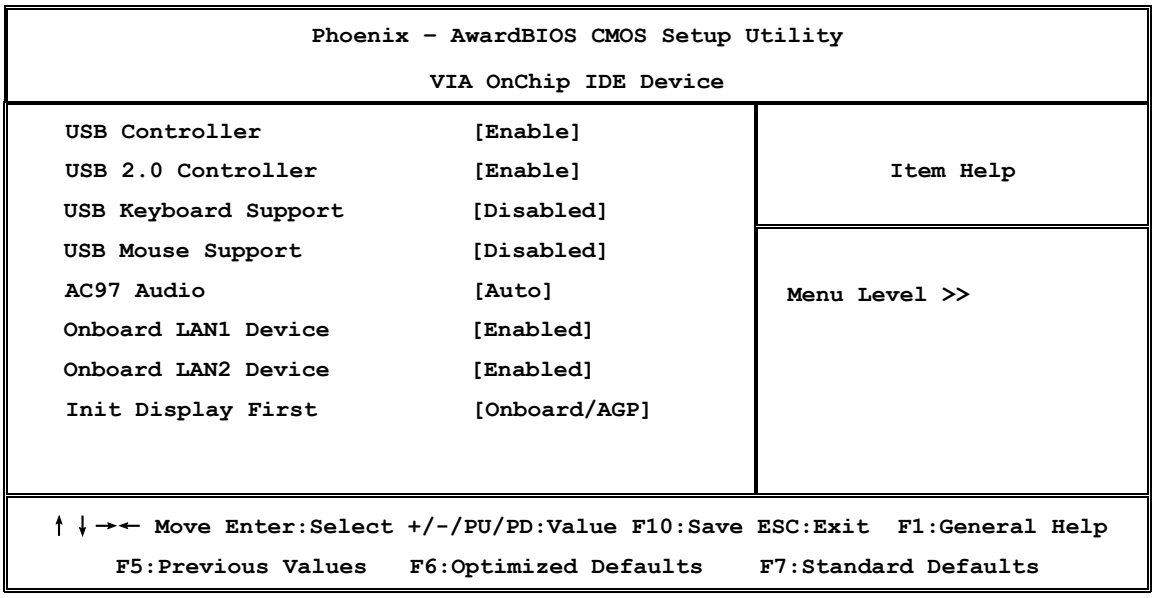
OnChip Primary/Secondary IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately. Available option is: Enabled and Disabled.

Primary/Secondary Master/Slave PIO
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

Primary/Secondary Master/Slave UDMA
Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33 and Ultra DMA/66, select Auto to enable BIOS support. The settings are: Auto, Disabled.

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The settings are: Enabled, Disabled.

3-7-2 Onboard Device



USB Controller

This item allow you to enable/ disable the onboard USB controller. Available option are Enable or Disabled

USB 2.0 Controller

This item allows you to enable/ disable USB 2.0 function.
Available option are Enabled and Disabled

USB Keyboard support

This item allows you to enable/ disable legacy USB Keyboard function.
Available option are Enabled and Disabled

USB Mouse support

This item allows you to enable/ disable legacy USB Mouse function.
Available option are enabled and Disabled

AC97 Audio

This item allow you to Enable/ disable the chipset family to support AC97 audio. Available option are Auto and Disabled.

Onboard LAN1 Device

This item allow you to decide to enable/ disable the Onboard LAN1 Controller. Available option are Enabled and Disabled

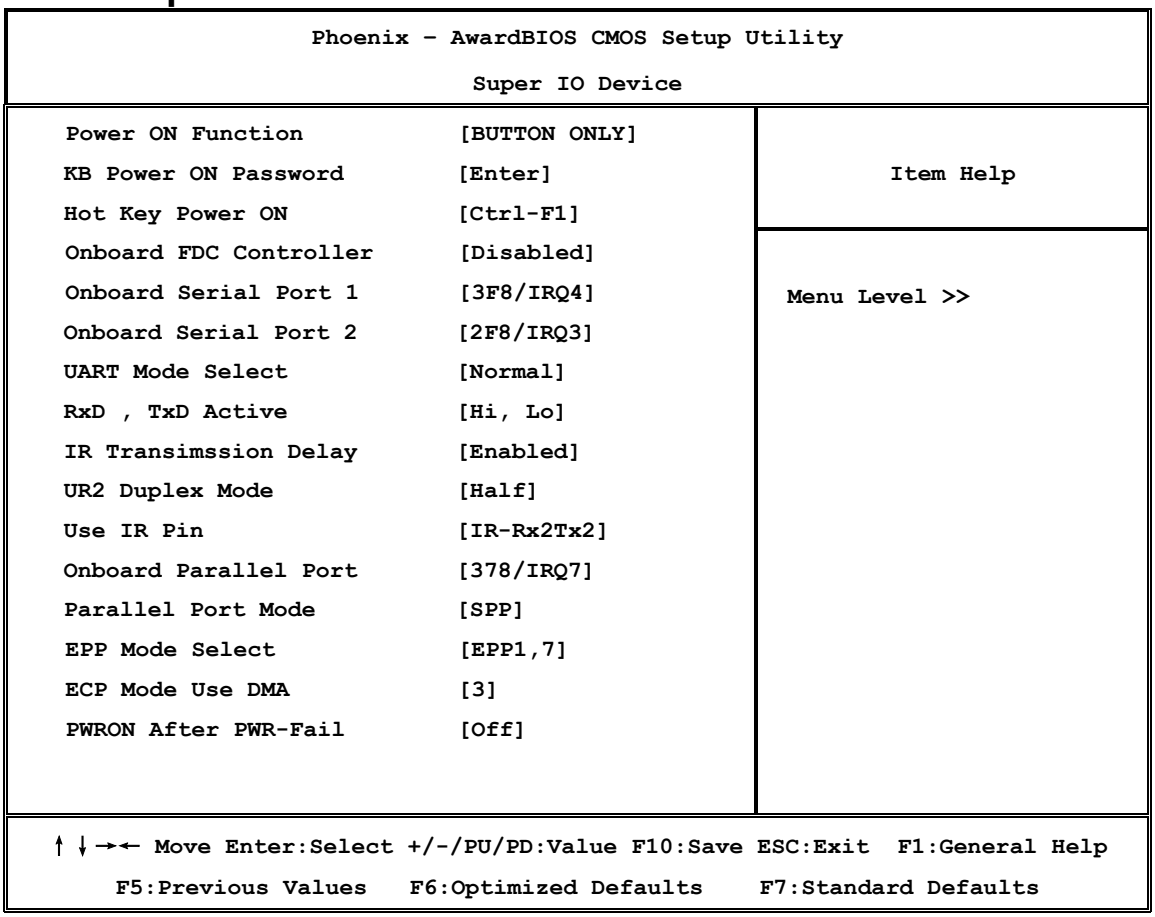
Onboard LAN2 Device

This item allow you to enable/ disable the Onboard LAN2 Controller . Available option are Enabled and Disabled.

Init Display First

This item allows you to select first display initialization at system boot up. Available option are onboard/AGP or PCI.

3-7-3 Super IO Device



Power ON Function

This item allow you to select system power on method, option are Hot key, Mouse, Button Only, Password or Any Key.

KB Power On Password

This item allow you to enter your keyboard power on password.

Hot Key Power On

This item allow you to select the Hot Key to power on the system

Onboard FDC Controller

This item allows you to enable/ disable onboard floppy disk controller function.
Available option are Enabled and Disabled

Onboard Serial Port 1

This item allows you to select the serial port 1 I/O/ IRQ to be used.

Onboard Serial Port 2

This item allows you to select the serial port 2 I/O/ IRQ to be used.

Onboard Parallel Port

There is a built-in parallel port on the on-board Super I/O chipset that Provides Standard, ECP, and EPP features. It has the following option:

Disabled

(3BCH/IRQ7)/ Line Printer port 0

(278H/IRQ5)/ Line Printer port 2

(378H/IRQ7) Line Printer port 1

Parallel Port Mode

SPP : Standard Parallel Port

EPP : Enhanced Parallel Port

ECP : Extended Capability Port

SPP/EPP/ECP/ECP+EPP

To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the EPP modes simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP+EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA" at this time, the user can choose between DMA channels 3 to 1. The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either EPP 1.7 spec. or EPP 1.9 spec. can be chosen.

Parallel Port Mode

This item allows you to select the parallel port mode to be used.
Available select are SPP, EPP and ECP.

PWRON After PWR-Fail

This item allows you to select the power stage when the main power supply were interrupted.
Available option: Former-states, On or Off.

3-8 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy saving while operating in a manner consistent with your own style of computer use.

```
CMOS Setup Utility – Copyright(C) 1984-2002 Award Software
                    Power Management Setup

   ACPI Function                  [Enable]        |  Item Help
   Power Management Option        [User Define]   |
   Video Off Method               [DPMS]          |
   Video Off In Suspend           [Yes]           |
   Suspend Type                   [Stop Grant]    |  Menu Level >
   HDD Power Down                 [Disabled]      |
   Soft-Off by PWR-BTTN           [Instant-Off]   |
   CPU THRM-Throttling            [50.0%]         |
   Wake-Up by PCI card            [Disable]       |
   Resume by Alarm                [Disable]       |
X  Date<of Month> Alarm            0              |
X  Time<hh:mm:ss> Alarm            0:0:0          |
   ** Reload Global Timer Events **                |
   Primary IDE 0                  [Disabled]      |
   Primary IDE 1                  [Disabled]      |
   Secondary IDE 0                [Disabled]      |
   Secondary IDE 1                [Disabled]      |
   FDD, COM, LPT Port             [Disabled]      |
   PCI PIRQ[A-D]#                 [Disabled]      |

↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help
     F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults
```

ACPI Function

This item allows you to Enabled/Disabled the Advanced Configuration and Power Management (ACPI). Available settings are Enabled and Disabled.

Power Management Option

The available selection for the Power Management is User's Define, Minimum Saving and Maximum Saving.

Video Off Method

This determines the manner in which the monitor is blanked.

DPMS (default) Initial display power management signaling.

Blank Screen	This option only writes blanks to the video buffer.
V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Video Off Option

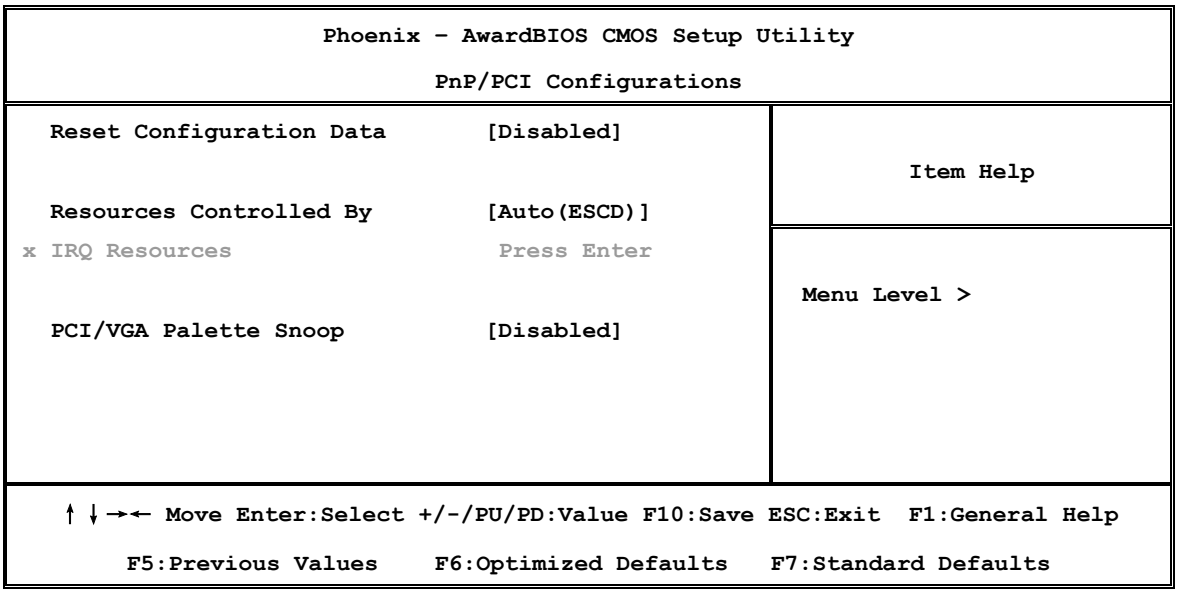
This determines the manner in which the monitor is blanked. The choices are Yes → Video will off, and No→ Video always On.

HDD Power Down

This item allow you to select to power down HDD when system enter power saving mode.

Available settings are Enabled and Disabled.

3-9 PnP/PCI Configuration Setup



Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The settings are: Enabled and Disabled.

Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95/98. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a ">").

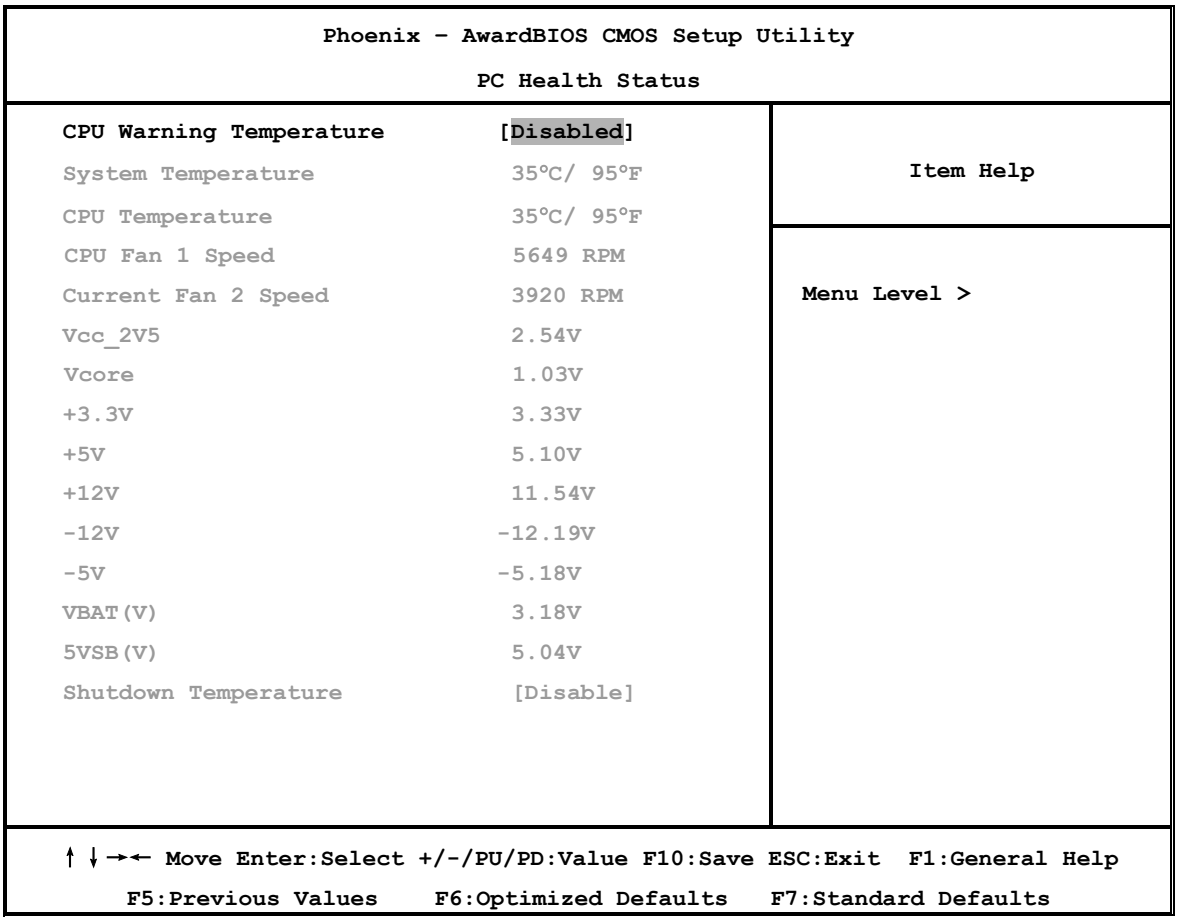
The settings are: Auto (ESCD), Manual.

PCI/VGA Palette Snoop

Leave this field at *Disabled*. The settings are Enabled, Disabled.

3-10 PC Health Status

This section shows the Status of you CPU, Fan, Warning for overall system status. This is only available if there is Hardware Monitor onboard.



Show PC Health in Post

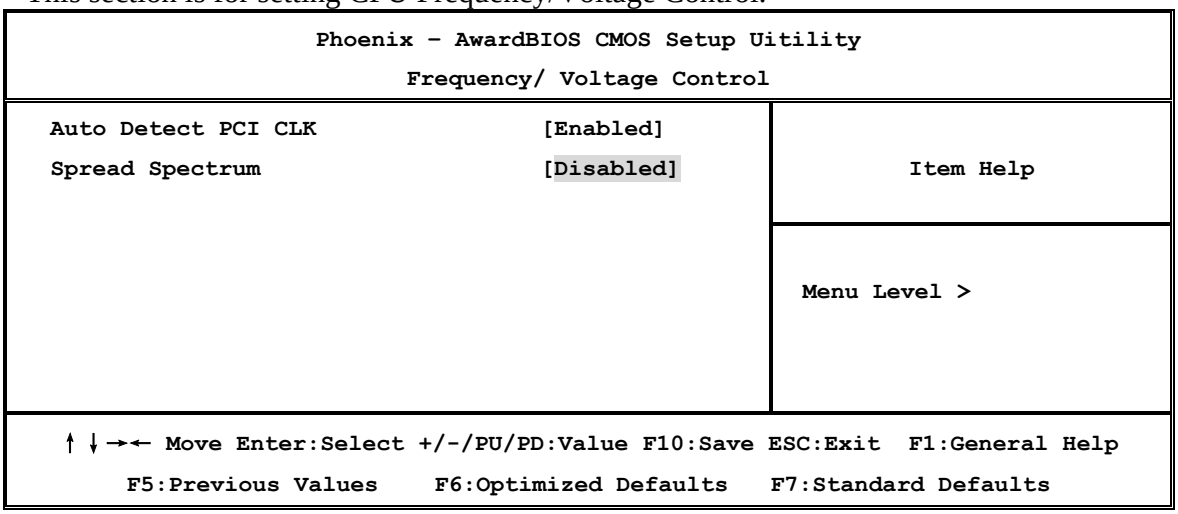
During Enabled, it displays information list below. The choice is either Enabled or Disabled.

Current CPU Temperature/Current System Temp/Current FAN1, FAN2 Speed/Vcore/ Vdd/3.3V/+5V/+12V/-12V/VBAT(V)/5VSB(V)

This will show the CPU/FAN/System voltage chart and FAN Speed.

3-11 Frequency/Voltage Control

This section is for setting CPU Frequency/Voltage Control.



Auto Detect PCI Clk

This item allows you to enable/disable auto detect PCI Clock.

The settings are: Enabled, Disabled.

Spread Spectrum

This item allows you to set the CPU Host/PCI clock and Spread Spectrum.

The settings are: Enabled, Disabled.

3-12 Load Standard/Optimized Defaults

Load Standard Defaults

When you press <Enter> on this item, you get confirmation dialog box with a message similar to:

Load Standard Defaults (Y/N)? N

Pressing <Y> loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

Pressing <Y> loads the default values that are factory settings for optimal performance system operations.

3-13 Set User Password

You can set either supervisor or user password, or both of them. The differences are:

User password: Can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

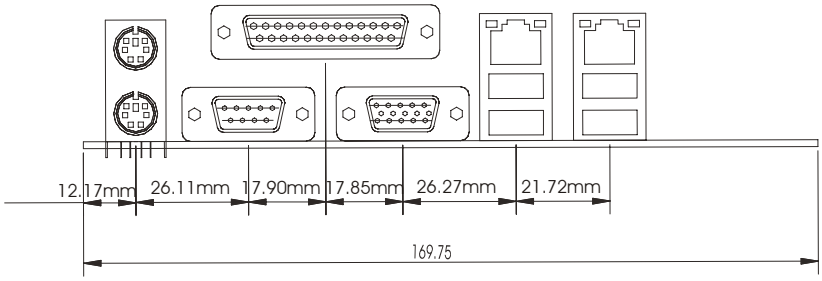
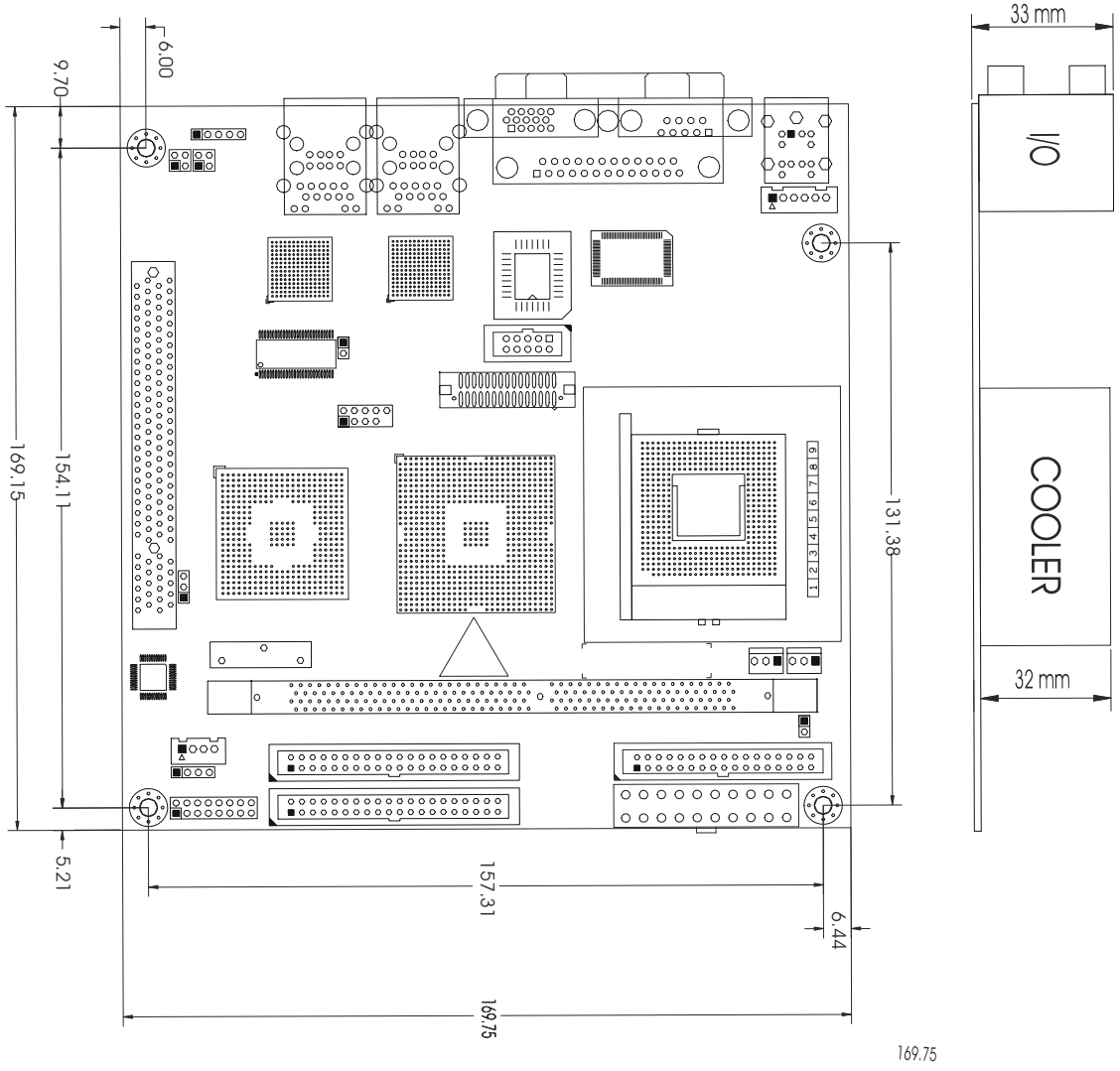
Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm that the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

MX855 Motherboard I/O Mechanical Draw